

AMENDMENTS TO THE CLAIMS

Please amend the present application as follows:

1 – 20. (Cancelled)

21. (New) A method for operating an optical system, the method comprising:

providing a substrate;

mounting a first optoelectronic element on a surface of the substrate;

forming a first channel in the substrate;

transporting a first heat transfer fluid through the first channel, the first heat transfer fluid being thermally coupled with the first optoelectronic element such that at least a quantity of heat produced by the first optoelectronic element is dissipated by the first heat transfer fluid;
and

using the first channel as an optical waveguide, wherein a portion of the substrate that defines the first channel exhibits a first refractive index, the first heat transfer fluid exhibits a second refractive index, and wherein the first heat transfer fluid operates as a core of the optical waveguide for directing optical signals.

22. (New) The method of claim 21, further comprising:

forming a second channel in the substrate; and

transporting a second heat transfer fluid through the second channel, the second heat transfer fluid being thermally coupled with the first optoelectronic element such that at least a quantity of heat produced by the first optoelectronic element is dissipated by the second heat transfer fluid.

23. (New) The method of claim 22, wherein the first heat transfer fluid is different than the second heat transfer fluid.

24. (New) The method of claim 21, wherein the substrate is substantially planar and has an exterior surface; and

wherein the first channel is substantially U-shaped, with first and second ends of the first channel terminating at the exterior surface of the substrate.

25. (New) The method of claim 21, wherein the surface of the substrate is a bottom surface of the substrate, and the first heat transfer fluid utilizes convection for heat dissipation.

26. (New) The method of claim 21, wherein the first heat transfer fluid is a liquid.

27. (New) The method of claim 26, further comprising:

providing a recirculator for transporting the first heat transfer fluid through the first channel.

28. (New) The method of claim 26, further comprising:

providing a means for removing heat from the first heat transfer fluid.

29. (New) The method of claim 26, further comprising:

providing a heat exchanger fluidly communicating with the first heat transfer fluid, the heat exchanger being operative to remove heat from the first heat transfer fluid.